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NATURAL DISASTER REDUCTION: HAZARD RESISTANT STRUCTURES

Technical session

Programme

The technical session on hazard resistant structures has been organized by the International Council for Scientific Unions (ICSU) Special Committee for the International Decade for Natural Disaster Reduction, representing both ICSU and the global engineering organizations World Federation of Engineering Organizations (WFEO)/Union of International Technical Associations (UITA).

Introduction by Sir James Lighthill, Chairman, Special Committee for the International Decade for Natural Disaster Reduction of ICSU (10 minutes)

The introductory statement will address the general theme, "What science and technology can do for natural disaster reduction", exemplified both by the present session and by the session on warning systems, organized by the World Meterological Organization (WMO). Reference will also be made to hazard assessment programmes in the context of identification of regions of high priority for hazard-resistant construction.

Accounts of the interface between these two Technical Committee Sessions then follow. They are typified by aspects of the ICSU/WMO demonstration project on tropical cyclone disasters, including programmes on both forecasting of, and preparedness against, tropical cyclones in many countries of the world.

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Contribution by Professor J.R. Choudhury (Bangladesh) (20 minutes)

The presentation will describe the development, construction and use of cyclone shelters, namely, structures resistant to the storm-surge inundation that a tropical cyclone may generate (especially in low-lying areas of Bangladesh) and which, provided proper training is given in their use, are able to protect people, along with many of their most valued possessions, after a warning has been received. (Note. Besides their use in an emergency, the shelters are suited also to a wide variety of community uses.)

Contribution by Professor A.G. Davenport (Canada), head of the famous Boundary Layer Wind Tunnel Laboratory, University of Western Ontario (20 minutes)

This presentation will survey design, construction, quality assurance and maintenance problems of structures resistant to extreme-wind loads, such as a tropical cyclone may generate (with emphasis on the Caribbean and Philippines experience) or to earthquake loads. The paper outlines the contributions made towards improvement of hazard resistance that can be made by a structure's user, owner, investor, insurer and builder, as well as by individual material suppliers, design professionals, building officials, code writers and inspectors.

Contribution by the representatives Mr. Stuart Mustow and Mr. Scott Steedman (30 minutes)

This presentation is concerned with techniques of design and construction of relatively low-cost structures that are resistant to extreme-wind disasters or earthquake disasters, as well as with associated quality-assurance issues related to problems of securing enforcement of building codes.

The presentation, with special emphasis on engineered structures, refers to several case-studies; for example, in the earthquake engineering field, these are derived from experience with the Erzincan (Turkey) earthquake of March 1992 and the Cairo (Egypt) earthquake of October 1992. Also, the important concept of "seismic-hazard auditing" will be illustrated by a case-study in Colombia.

Contribution by Professor A.S. Arya (India), member of the Scientific and Technical Committee (20 minutes)

This presentation, on the protection of non-engineered housing from natural hazards, brings together knowledge derived from age-old indigenous approaches and the results of research carried out in the past few decades on the achievement of disaster protection for such buildings. The methods described, of an incremental nature (maintaining, and yet adding to, the basic materials and techniques already used, rather than replacing them completely) are found to be socially acceptable, economically feasible and easily absorbed into local construction methodologies. The presentation ends with recommendations on the transfer of the necessary knowledge to local levels.

Contribution by Professor A.A. Giesecke (Peru), member of the Scientific and Technical Committee (10 minutes)

This presentation is concerned with methods for reconditioning existing adobe housing so as to mitigate the effects of earthquakes. The basic emphasis is on simple, low-cost procedures for such reconditioning that take into account size, shape and construction characteristics and soil types and that are aimed at delaying collapse sufficiently to save many lives by allowing time for escape.

Contribution by a representative of the Malaysian Rubber Producers Research Association (10 minutes)

This presentation will deal with the promise of new techniques being developed in cooperation with the United Nations Industrial Organization (UNIDO), on use of a new and highly effective type of latex base-isolators, initially for engineered structures but capable of development for producing rubber bearings suitable for earthquake protection of low-cost housing.

General discussion (50 minutes)